Application Programming With QTKit

Session 211

These are confidential sessions—please refrain from filming or taking pictures.

Graphics and Media

Application Programming With QTKit

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Apple

http://developer.apple.com/wwdc2005/

QTKit

- A Cocoa framework for opening, displaying, and manipulating QuickTime movies

QTKit

Already has several key clients

- Spotlight
- QuickTime Player
- Pixar in-house tools

What You'll Learn

- Brief overview of QTKit
- Hands-on experience using QTKit
  - Command-line tools
  - Graphical applications
  - Multi-threaded applications
- Summary and Q&A

Related Sessions

QTKit for Cocoa Developers	Tiger Lab Wednesday 6:30PM
QTKit, QTJava, QT ActiveX, and AppleScript	Graphics & Media Lab Thursday 9:00AM

Introduction to QTKit

http://developer.apple.com/wwdc2005/

QuickTime for Cocoa Kit

- QTMovieView
- QTMovie
- QTTrack
- QTMedia
- QTDataReference
- QTTime
- QTTimeRange

QTTime

Holds information about a time or a duration

```
typedef struct {
   long long            timeValue;
   long                 timeScale;
   long                 flags;
} QTTime;

enum {
   kQTTimeIsIndefinite =       1 << 0
};
```

QTTime

Lots of utility functions for creating and manipulating times

```
QTTime QTMakeTime (long long timeValue, long timeScale);
QTTime QTTimeIncrement (QTTime time, QTTime increment);
QTTime QTMakeTimeScaled (QTTime time, long timeScale);
```

QTTimeRange

Holds information about a time range

```
typedef struct {
  QTTime          time;
  QTTime          duration;
} QTTimeRange;


QTTimeRange QTMakeTimeRange (QTTime time, QTTime duration);
BOOL QTTimeInTimeRange (QTTime time, QTTimeRange range);
```

QTMovie

- Represents a QuickTime Movie and MovieController
- Multiple ways to create instances
  - From a filename or URL
  - From a data reference
  - From an NSData instance
  - From a movie in the NIB file

```
+ (id)movie;
+ (id)movieWithFile:(NSString *)fileName error:(NSError **)errorPtr;
+ (id)movieWithURL:(NSURL *)url error:(NSError **)errorPtr;
+ (id)movieWithDataReference:(QTDataReference *)dataReference
                       error:(NSError **)errorPtr;
+ (id)movieWithData:(NSData *)data error:(NSError **)errorPtr;
+ (id)movieNamed:(NSString *)name error:(NSError **)errorPtr;
```

QTMovie

```
- (void)gotoBeginning;
- (void)gotoEnd;
- (QTTime)currentTime;
- (NSDictionary *)movieAttributes;
- (void)deleteSegment:(QTTimeRange)segment;
- (NSArray *)tracks;
- (Movie)quickTimeMovie;
- (MovieController)quickTimeMovieController;
```

QTTrack

- Represents a QuickTime Track
- Only one way to create instances: from a QuickTime Track
- Methods for
  - Getting and setting track attributes
  - If necessary, obtaining QuickTime primitive

```
- (QTTrack *)initWithQuickTimeTrack:(Track)track;
- (NSDictionary *)trackAttributes;
- (Track)quickTimeTrack;
```

QTMovieView

- Subclass of NSView associated with a QTMovie
- Some attributes
  - Controller bar visible or invisible
  - Preserves aspect ratio
  - Fill color
  - Editable state
- IBActions for movie navigation, editing

```
- (void)setMovie:(id)movie;
- (void)setEditable:(BOOL)editable;
- (IBAction)cut:(id)sender;
- (IBAction)copy:(id)sender;
- (IBAction)selectAll:(id)sender;
```

Hands-On

Building Command-Line Tools with QTKit

Tim Monroe
QTKit Lead Engineer

http://developer.apple.com/wwdc2005/

Demo

QTKit and QuickTime Player

Gary Flint
QuickTime Player Lead Engineer

http://developer.apple.com/wwdc2005/

Multiple Undo

```
-(void)makeWindowControllers
{
 ...

 // make the movie editable
 [_movie setAttibute:[NSNumber numberWithBool:YES]
             forKey:QTMovieEditableAttribute];

 ...
}
```

Drag and Drop

```
-(void)makeWindowControllers
{
  ...

  ...
}
```

Saving a Document

```
-(IBAction)saveDocument:(id)sender
{
  ...

 if ([_movie canUpdateMovieFile])
   [super saveDocument:sender];
 else
   [super saveDocumentAs:sender];

  ...
}
```

Saving a Document (Cont.)

```
-(BOOL)writeWithBackupToFile:(NSString *)fileName
          ofType:(NSString *)type
          saveOperation:(NSSaveOperation)saveOperationType
{
 BOOL success = NO;
 ...

 // save the movie file
 if (saveOperationType == NSSaveOperation)
  success = [_movie updateMovieFile];

 ...
}
```

Listening For Notifications

```
-(void)setMovie:(QTMovie *)movie
{
 if (_movie) {
  NSNotificationCenter *center = [NSNotificationCenter
                                        defaultCenter];
  ...

  // standard notifications
  [center addObserver:self selector:@selector(movieEdited:)
          name:QTMovieEditedNotification object:_movie];

  ...
}
```

Listening For Notifications

```
// standard notifications
QTMovieEditedNotification
QTMovieSizeDidChangeNotification
QTMovieRateDidChangeNotification
QTMovieDidEndNotification
QTMovieLoadStateDidChangeNotification

// wired movie support
QTMovieCloseWindowRequestNotification
QTMovieExitFullScreenRequestNotification
QTMovieEnterFullScreenRequestNotification

// streaming movie support
QTMovieStatusStringPostedNotification
```

Hands-On
Building an Application with QTKit

Tom Maremaa
Senior Technical Writer

http://developer.apple.com/wwdc2005/

What You'll Learn

- How to build a graphical application from scratch
- Integrate QTKit into the Cocoa document architecture

File Menu

File | New | Open... | Open Recent | Import | Export | Close | Save | Save As... | Page Setup... | Print...

JPEG still image

QTMovieView object

MP3 audio clip

Movie Menu

File | Edit | Movie

Start
Stop
Go To Beginning
Go To End
Go To Poster Frame
Step Forward
Step Backward

Set Fill Color...

Show Controller
Preserve Aspect Ratio
Loop
Loop Palindrome
Clone

Edit Menu

File | Edit

Undo
Redo

Cut
Copy
Paste
Delete
Select All

Add
Add Scaled
Replace
Trim

Special Characters...

Rough Sketch of QTKitPlayer

Hands-On

Tips and Tricks using QTKit in Document Applications

Tim Monroe
QTKit Lead Engineer

http://developer.apple.com/wwdc2005/

Hands-On
Advanced Uses of QTKit

Dr. Michael B. Johnson
MPG Group
Pixar Animation Studios

http://developer.apple.com/wwdc2005/

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Q&A

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WWDC2005

Worldwide Developers Conference